

## CLAIMS

## What Is Claimed Is:

1. A hypoallergenic metal amino acid chelate composition, comprising  
5 metal amino acid chelates that are substantially free of allergens such that administration of the metal amino acid chelates in an effective amount to cause a medicinal, cosmetic, or nutritional result in a subject does not produce a discernable adverse allergic reaction, said metal amino acid chelates having a naturally occurring amino acid to metal molar ratio of from about 1:1 to 4:1.  
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2. A composition as in claim 1, wherein the naturally occurring amino acid is selected from the group consisting of alanine, arginine, asparagine, aspartic acid, cysteine, cystine, glutamine, glutamic acid, glycine, histidine, hydroxyproline, isoleucine, leucine, lysine, methionine, ornithine, phenylalanine, 15 proline, serine, threonine, tryptophan, tyrosine, valine, and combinations thereof.
3. A composition as in claim 1, wherein the metal is selected from the group consisting of iron, zinc, copper, manganese, calcium, chromium, vanadium, selenium, silicon, molybdenum, tin, nickel, boron, cobalt, gold, silver, 20 and combinations thereof.
4. A composition as in claim 1, wherein the metal is a polyvalent metal, and the naturally occurring amino acid to metal molar ratio is from about 1:1 to 3:1.  
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5. A composition as in claim 1, wherein the metal is ferrous iron and the naturally occurring amino acid is glycine, and wherein the iron to glycine molar ratio is about 2:1.

6. A composition as in claim 1, wherein the metal is copper and the naturally occurring amino acid is glycine, and wherein the copper to glycine molar ratio is about 2:1.

5 7. A composition as in claim 1, wherein the metal is zinc and the naturally occurring amino acid is glycine, and wherein the zinc to glycine molar ratio is about 2:1.

10 8. A composition as in claim 1, wherein the metal is manganese and the naturally occurring amino acid is glycine, and wherein the manganese to glycine molar ratio is about 2:1.

15 9. A composition as in claim 1, wherein the metal is ferric iron and the naturally occurring amino acid is glycine, and wherein the ferric iron to glycine molar ratio is about 3:1.

10. A composition as in claim 1, wherein the metal is chromium and the naturally occurring amino acid is glycine, and wherein the chromium to glycine molar ratio is about 3:1.

20 11. A composition as in claim 1, wherein the metal is magnesium and the naturally occurring amino acid is glycine, and wherein the magnesium to glycine molar ratio is about 1:1.

25 12. A composition as in claim 1, wherein the metal is calcium and the naturally occurring amino acid is glycine, and wherein the calcium to glycine molar ratio is about 1:1.

13. A composition as in claim 1, wherein the naturally occurring amino

acid used to prepare the metal amino acid chelates is prepared by a method other than protein hydrolysis.

14. A composition as in claim 1, wherein the naturally occurring amino acid used to prepare the metal amino acid chelates is prepared by protein hydrolysis, and wherein the protein used in the hydrolysis is hypoallergenic.

15. A composition as in claim 1, wherein the allergens are removed from the naturally occurring amino acid after formation, but before chelation with the metal.

16. A composition as in claim 1, wherein specific allergens are identified with respect to the subject, and the subject is susceptible to an allergic reaction upon exposure to the allergens.

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17. A composition as in claim 1, wherein the subject is an animal.

18. A composition as in claim 1, wherein the subject is human.

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19. A hypoallergenic metal amino acid chelate-containing composition, a) hypoallergenic metal amino acid chelates having a naturally occurring amino acid to metal molar ratio of from about 1:1 to 4:1, said metal amino acid chelates being blended with,

b) a hypoallergenic formulation additive,

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wherein the metal amino acid chelates and the formulation additive are substantially free of allergens such that administration of the composition to a subject in an effective amount to cause a medicinal or nutritional result does not produce a discernable adverse allergic reaction.

20. A composition as in claim 19, wherein the formulation additive is a hypoallergenic organic acid.

21. A composition as in claim 20, wherein the hypoallergenic organic acid  
5 is selected from the group consisting of citric acid, fumaric acid, succinic acid, tartaric acid, malic acid, lactic acid, gluconic acid, ascorbic acid, pantothenic acid, folic acid, lipoic acid, oxalic acid, maleic acid, formic acid, acetic acid, pyruvic acid, adipic acid, alpha-ketoglutaric acid, and mixtures thereof.

10 22. A composition as in claim 19, wherein the formulation additive is a hypoallergenic filler.

23. A composition as in claim 19, wherein the hypoallergenic filler is selected from the group consisting of grain flours, maltodextrins, vegetable flours  
15 or powders, inulin, and combinations thereof.

24. A composition as in claim 19, wherein the formulation additive is a hypoallergenic flow control agent.

20 25. A composition as in claim 24, wherein the hypoallergenic flow control agent is selected from the group consisting of fumed silica, stearic acid, talc, and combinations thereof.

25 26. A composition as in claim 19, wherein the formulation additive is selected from the group consisting of free amino acids, amino acid salts, and combinations thereof.

27. A composition as in claim 19, wherein the formulation additive is selected from the group consisting of vitamins, coenzymes, cofactors, herbs,

herbal extracts, protein powders, and combinations thereof.

28. A composition as in claim 19, wherein the formulation additive is selected from the group consisting of mineral oils, binders, flavoring or taste-free additives, and combinations thereof.

29. A composition as in claim 19, wherein the naturally occurring amino acid is selected from the group consisting of alanine, arginine, asparagine, aspartic acid, cysteine, cystine, glutamine, glutamic acid, glycine, histidine, 10 hydroxyproline, isoleucine, leucine, lysine, methionine, ornithine, phenylalanine, proline, serine, threonine, tryptophan, tyrosine, valine, and combinations thereof.

30. A composition as in claim 19, wherein the metal is selected from the group consisting of iron, zinc, copper, manganese, calcium, chromium, 15 vanadium, selenium, silicon, molybdenum, tin, nickel, boron, cobalt, gold, silver, and combinations thereof.

31. A composition as in claim 19, wherein the metal is a polyvalent metal, and the naturally occurring amino acid to metal molar ratio is from about 2:1 to 20 3:1.

32. A composition as in claim 19, wherein the naturally occurring amino acid used to make the metal amino acid chelates is not prepared by protein hydrolysis.

25 33. A composition as in claim 19, wherein the naturally occurring amino acid used to make the metal amino acid chelates is prepared by protein hydrolysis, and wherein the protein used in the hydrolysis is hypoallergenic.

34. A composition as in claim 19, wherein the allergens are removed from the metal amino acid chelate after formation, but before chelation with the metal.

35. A composition as in claim 19, wherein the subject is an animal.

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36. A composition as in claim 19, wherein the subject is a human.

37. A composition as in claim 19, wherein the subject is predisposed to an allergic reaction when exposed to metal amino acid chelates and formulation 10 additives that are non-hypoallergenic.

38. A method of preparing hypoallergenic metal amino acid chelates, comprising:

15 a) selecting an amino acid source determined to be hypoallergenic;  
b) selecting a metal source determined to be hypoallergenic; and  
c) chelating an amino acid of the amino acid source to a metal of the metal source to form a hypoallergenic metal amino acid chelate.

39. A method as in claim 38, wherein during the step of selecting the 20 amino acid source, if a first amino acid source is not hypoallergenic, additional amino acid sources are evaluated until a hypoallergenic amino acid source is ascertained.

40. A method as in claim 38, wherein during the step of selecting the 25 metal source, if a first metal source is not hypoallergenic, additional metal sources are evaluated until a hypoallergenic metal source is ascertained.

41. A method as in claim 38, wherein the amino acid source is not prepared by protein hydrolysis.

42. A method as in claim 38, wherein the amino acid source is prepared by protein hydrolysis, and wherein the protein used in the hydrolysis is hypoallergenic.

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43. A method as in claim 38, wherein the amino acid source is rendered hypoallergenic after formation, but before chelation with the metal.

44. A method as in claim 38, further comprising selecting an additive 10 determined to be hypoallergenic, and including the additive as a mixture with the hypoallergenic metal amino acid chelate.

45. A method as in claim 44, wherein the additive is selected from the group consisting of hypoallergenic organic acids, hypoallergenic free amino 15 acids, hypoallergenic amino acid salts, hypoallergenic fillers, hypoallergenic flow control agents, hypoallergenic lubricants, hypoallergenic flow agents, hypoallergenic hydroscopicity reducing agents, hypoallergenic pH control agents, hypoallergenic catalysts, hypoallergenic vitamins, hypoallergenic dust control 20 agents, hypoallergenic binders, hypoallergenic disintegrating agents, hypoallergenic flavoring agents, hypoallergenic flavoring agents, hypoallergenic taste-reducing agents, hypoallergenic capsule shells, hypoallergenic shellacs, hypoallergenic waxes, hypoallergenic gelatin sources, hypoallergenic emulsifiers, 25 hypoallergenic oils, and combinations thereof.

46. A method of administering metal amino acid chelates, comprising:  
a) identifying a subject susceptible to a type of allergic reaction;  
b) formulating a metal amino acid chelate by:  
i) selecting an amino acid source determined to be hypoallergenic  
with respect to the type of allergic reaction;

- ii) selecting a metal source determined to be hypoallergenic with respect to the type of allergic reaction, and
- iii) chelating an amino acid of the amino acid source to a metal of the metal source to form a hypoallergenic metal amino acid chelate; and

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- c) administering the hypoallergenic amino acid to the subject.

47. A method as in claim 46, wherein the subject is allergic to at least one of soy, peanuts, tree nuts, crustaceans, finfish, dairy, wheat, eggs, corn, gelatin, 10 whey, chocolate, and strawberries.

48. A method as in claim 46, wherein during the step of selecting the amino acid source, if a first amino acid source is not hypoallergenic, additional amino acid sources are evaluated until a hypoallergenic amino acid source is 15 ascertained.

49. A method as in claim 48, wherein during the step of selecting the metal source, if a first metal source is not hypoallergenic, additional metal sources are evaluated until a hypoallergenic metal source is ascertained.

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50. A method as in claim 46, wherein the amino acid source is prepared by a method other than protein hydrolysis.

51. A method as in claim 46, wherein the amino acid source is prepared 25 by protein hydrolysis, and wherein the protein used in the hydrolysis is hypoallergenic.

52. A method as in claim 46, wherein the amino acid source is rendered hypoallergenic after formation, but before chelation with the metal.

53. A method as in claim 46, further comprising steps of selecting an additive determined to be hypoallergenic, and including the additive as a mixture with the hypoallergenic metal amino acid chelate.

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54. A method as in claim 52, wherein the additive is selected from the group consisting of hypoallergenic organic acids, hypoallergenic free amino acids, hypoallergenic amino acid salts, hypoallergenic fillers, hypoallergenic flow control agents, hypoallergenic lubricants, hypoallergenic flow agents, 10 hypoallergenic hydroscopicity reducing agents, hypoallergenic pH control agents, hypoallergenic catalysts, hypoallergenic vitamins, hypoallergenic dust control agents, hypoallergenic binders, hypoallergenic disintegrating agents, hypoallergenic flavoring agents, hypoallergenic flavoring agents, hypoallergenic taste-reducing agents, hypoallergenic capsule shells, hypoallergenic shellacs, 15 hypoallergenic waxes, hypoallergenic gelatin sources, hypoallergenic emulsifiers, hypoallergenic oils, and combinations thereof.

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